RNeasy® Total RNA System

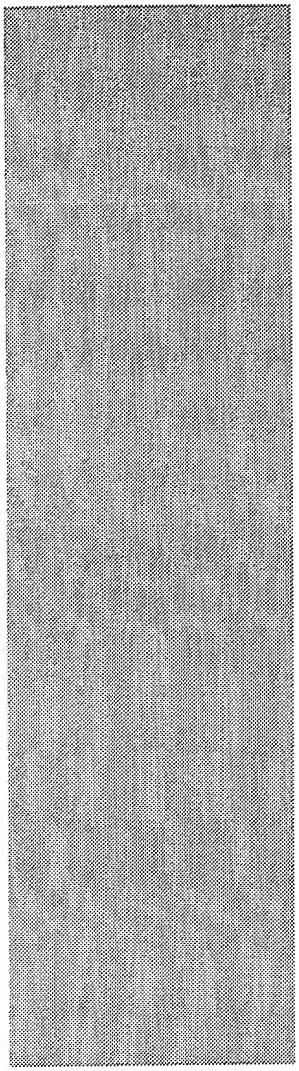
The RNeasy® Total RNA isolation system is designed for fast and efficient isolation of from a wide variety of samples. Different kits are tailored to suit different RNA purificati RNeasy sample preparation technology is fully licensed, allowing RNeasy purified nuc to be used in any molecular assay or other downstream application without risk of pate infringement.

Features and benefits

- High-quality total RNA in minutes
- No phenol/chloroform extraction, no CsCl gradients, no LiCl or ethanol precipita
- Excellent recovery of RNA from very small to large amounts of starting material
- Ready-to-use RNA for any downstream application

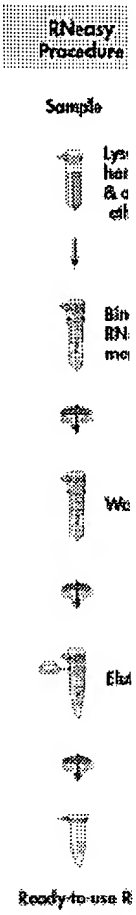
RNeasy Kit Options

Sample Source	Recommended RNeasy Kit
Animal cells	
Small-to large-scale	RNeasy Mini, Midi, and Maxi Kits
96-well format	RNeasy 96 Kit
Automated, 96-well format	RNeasy 96 BioRobot Kit
Animal tissues	
Small- to large-scale	RNeasy Mini, Midi, and Maxi Kits
Bacteria or yeast	
Small-to large-scale	RNeasy Mini, Midi, and Maxi Kits
Whole blood	see QIAamp® RNA Blood Mini Kit
Plant cells or tissues	RNeasy Plant Mini Kit
Filamentous fungi	RNeasy Plant Mini Kit
In vitro transcripts and enzymatic reactions	
Small-to large-scale	RNeasy Mini, Midi, and Maxi Kits
96-well format	RNeasy 96 Kit
—	Additional RNeasy Buffers



Principle ·

RNeasy Kits simplify total RNA isolation by combining the stringency of guanidine–isothiocyanate lysis with the speed of silica-gel–membrane purification. RNeasy technology replaces cumbersome and problematic RNA isolation procedures such as phenol/chloroform extraction*, centrifugation through CsCl cushions, and precipitation with LiCl or alcohol. RNeasy purification also provides an enrichment for mRNA since most RNAs <200 nucleotides (which comprise 15–20% of total RNA) are selectively excluded.



Procedure ·

Samples are first lysed and then homogenized. Ethanol is added to the lysate to provide ideal binding conditions (see flowchart). The lysate is then loaded onto the RNeasy spin column. RNA binds, and all contaminants are efficiently washed away. Pure, concentrated RNA is eluted in water.

Applications ·

RNA purified with RNeasy technology has A_{260}/A_{280} ratios of 1.9–2.1† and is ideal for use in all applications. (See RNeasy references.) Downstream applications include:

- Northern, dot, and slot blotting
- RT-PCR
- Poly A^+ RNA selection

Other sections of interest

References for total RNA isolation and cleanup with the RNeasy System

Related Products
Total RNA isolation from whole blood with the QIAamp RNA Blood Mini Kit
Viral RNA isolation from cell-free body fluids with the QIAamp Viral RNA Mini Kit
Poly A+ mRNA isolation with the Oligotex™ System
Parallel isolation of RNA and genomic DNA and isolation of low-molecular-weight R
the QIAGEN® RNA/DNA System
QIAGEN Reverse Transcriptases

Accessories
Homogenization of cell and tissue lysates with QIAshredder™ homogenizers
DNase digestion during RNA purification with the RNase-Free DNase Set
Plasticware and tape sheets

Technical information
Spectrophotometric quantitation of nucleic acids
Sizes and molecular weights of various RNAs
RNA content and distribution in various cells and tissues

QIAGEN purification technologies

QIAGEN literature
Brochure: *High-Performance RNA*

The QIAGEN RNA Club

** RNA prepared using phenol-extraction methods may contain contaminating phenol, which affects the A_{260} the purified RNA due to absorbance of phenol at 270 and 275 nm (see Stulnig, T.M. and Amberger, A. (1994 contaminating phenol in nucleic acid preparations. BioTechniques, **16**, 403).*

† Measured in 10 mM Tris-Cl, pH 7.5. See "Spectrophotometric Quantitation of Nucleic Acids."

Back to top

NEXT

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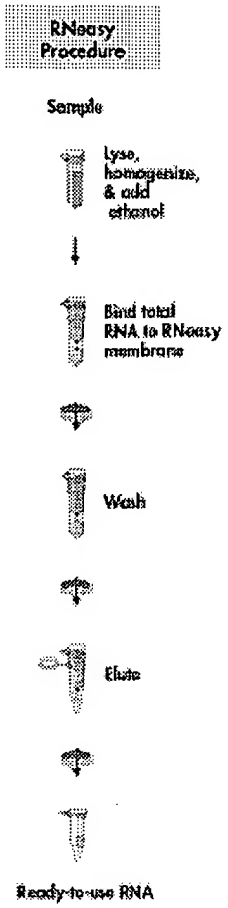

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RNA Isolation and Purification

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References for Total RNA Isolation and Cleanup with the RNeasy System

This is a partial list of papers citing RNeasy Kits for total RNA isolation and cleanup. Please contact QIAGEN Technical Services or your local distributor for a complete references.

Selected RNeasy References

Dechant, G., Tsoulfas, P., Parada, L.F., and Barde, Y.A. (1997) The neurotrophin receptor p75 binds neurotrophin-3 on sympathetic neurons with high affinity and specificity. J. Neurosci. ***17****, 5281.*
▶ Total RNA from **chicken ganglia** and **neuronal cell cultures** for RT-PCR

Dudareva, N. Cseka, L., Blanc, V.M., and Pichersky, E. (1996) Evolution of floral sc Clarkia: novel patterns of S-linalool synthase gene expression in the C. breweri flow Plant Cell ***8****, 1137.*
▶ Total RNA from **Clarkia flower parts** to localize gene expression

Estacio, W., Santa Anna-Arriola, S., Adedipe, M., and Márquez-Magaña, L.M. (1998 Dual promoters are responsible for transcription initiation of the fla/che *operon in Ba subtilis.* J. Bacteriol. **180**, 3548.
▶ Total RNA from *Bacillus subtilis* for primer-extension analysis

Gonzalez, P., Zigler, J.S., Jr., Epstein, D.L., and Borrás, T. (1999) Identific and isolation of differentially expressed genes from very small tissue sampl BioTechniques ***26****, 884.*
▶ Total RNA from small amounts of **human eye tissue** for **expression-arra analysis**

Hassink, S.G. et al. (1997) Placental leptin: an important new growth facto intrauterine and neonatal development? Pediatrics ***100(1)****, e1.*
▶ Total RNA from **human placenta and fat biopsy samples** for multiplex RT-PCR

Hoecker, U., Tepperman, J.M., and Quail, P.H. (1999) SPA1, a WD-repeat protein specific to pytochrome A signal transduction. Science ***284****, 496.*
▶ Total RNA from **arabidopsis** to study **gene expression of a phytochrom suppressor**

Lepik, D., Ilves, I., Kristjuhan, A., Maimets, T., and Ustav, T. (1998) p53 p is a suppressor of papillomavirus DNA amplificational replication. J. Virol 6882.
▶ Total RNA from **transfected CHO** cells for northern-blot analysis

Lewin, A.S. et al. (1998) Ribozyme rescue of photoreceptor cells in a transg rat model of autosomal dominant retinitis pigmentosa. Nature Med. 4, 967.
▶ Total RNA from **rat retinae** for RT-PCR

McKenzie, D.J., McLean, M.A., Mukerji, S., and Green, M. (1997) Improve RNA extraction from woody plants for the detection of viral pathogens by reverse transcription–polymerase chain reaction. Plant Disease 81, 222.
▶ **Viral RNA from woody plants** for RT-PCR

Meller, V.H., Wu, K.H., Roman, G., Kuroda, M.I., and Davis, R.L. (1997) r RNA paints the X chromosome of male drosophila and is regulated by the dosage compensation system. Cell 88, 445.
▶ Total RNA from **drosophila** for developmental gene-expression analysis

*Motlik, J., Carnwath, J.W., Herrmann, D. Terletski, V., Anger, M., and Niemann, H. (1998) Automated recording of RNA differential display patte from **pig granulosa cells**. BioTechniques 24, 148.*
▶ Total RNA from pig granulosa cells for differential-display RT-PCR

Nakayama, J.-i., Tahara, H., Tahara, E., Saito, M., Ito, K., Nakamura, H., Nakanishi, T., Tahara, E., Ide, T., and Ishikawa, F. (1998) Telomerase activation by hTRT in human normal fibroblasts and hepatocellular carcino Nature Genet. 18, 65.
▶ Total RNA from **human liver carcinoma biopsy samples** for RT-PCR

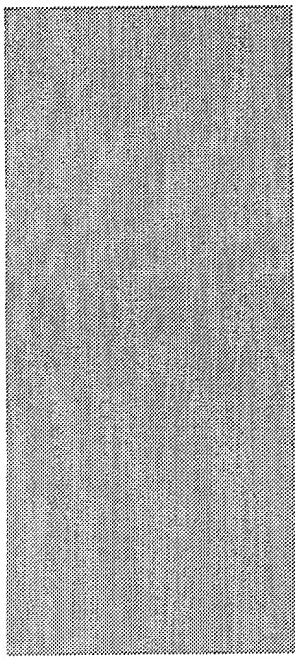
Nichols, B.L., et al. (1997) Effects of malnutrition on expression and activit lactase in children. Gastroenterology 112, 742.
▶ Total RNA from small amounts of **embedded tissue** after several years of storage

Outinen, P.A., et al. (1998) Characterization of the stress-inducing effects o homocysteine. Biochem. J. 332, 213.
▶ RNeasy total RNA and Oligotex mRNA for **expression-array and differential-display** analysis

Popik, W., Hesselgesser, J.E., and Pitha, P.M. (1998) Binding of human immunodeficiency virus type 1 to CD4 and CXCR4 receptors differentially regulates expression of inflammatory genes and activates the MEK/ERK signaling pathway. J. Virol. 72, 6406.
▶ Total RNA from **Jurkat T cells** for RT-PCR

Randhawa, J.S., Marriott, A.C., Pringle, C.R., and Easton, A.J. (1997) Res of synthetic minireplicons establishes the absence of the NS1 *and* NS2 *gene from avian pneumovirus. J. Virol. 71, 9849.*
▶ RNA cleanup of **in vitro transcripts for transfection** of mammalian cells

Rieder, G., Hatz, R.A., Moran, A.P., Walz, A., Stolte, M., and Enders, G. (1 Role of adherence in interleukin-8 induction in Helicobacter pylori*-associat*



gastritis. Infect. Immun. 65, 3622.

▶ Total RNA from **human gastric biopsy samples** for competitive RT-PCR

Su, S., Vivier, R.G., et al. (1997) High-throughput RT-PCR analysis of mul transcripts using a microplate RNA isolation procedure. BioTechniques 22, 1107.

▶ **High-throughput RNA isolation** with the RNeasy 96 Kit for transcription-pattern analysis

Back to top

PREVIOUS NEXT